ENGINE 111 in MODELS 124, 163, 170, 202, 203, 208, 210
ENGINE 112 in MODELS 129, 163, 170, 202, 203, 208, 210, 220
ENGINE 112, 113 in MODEL 463
ENGINE 113 in MODELS 129, 163, 202, 208, 210, 215, 220
ENGINE 137 in MODEL 215, 220
ENGINE 166 in MODEL 168

Oil sludging in gasoline engines with ASSYST maintenance system

Recently we have determined that time and time again oil sludging occurs in gasoline engines with an ASSYST maintenance system.

Oil sludging can lead to the following complaints:

- engine oil consumption
- engine smoke (white/blue)
- influencing of oil level indicator
- clogged oil filter, engine oil thickened like jelly
- Check engine lamp illuminated
- oil sludge visible during assembly job, e.g. in oil filter, in cylinder head covers, condensation sludging (engine 166) etc.

The following list of causes may lead individually or as a combination to engine oil sludging:

- Crankcase ventilation inoperable, function orifices, bores, passages in cylinder head cover, cylinder head, crankcase etc. are mechanically sealed. A nonfunctioning crankcase ventilation boosts loads on the engine oil through organic nitrates. The risk of oil sludging increases.

  The mechanical condition of the engine is always to be checked, i.e. all engine oil drain orifices on the cylinder head and crankcase and all crankcase ventilation ducts must be free of obstacles. Crankcase breather lines may not be kinked. Check the ventilation bores in the cylinder head covers.

- The engine oil used does not comply with the specifications in Sheet 229.1 or 229.3 of the Specifications for Service Products. The additive process, e.g. dirt-carrying capability, neutralization capability and oxidation resistance as well as the quality of the base stock influence sludging time.

  Use of engine oils with best possible resistance to formation of sludge, i.e. use only tested and approved engine oils (from Sheet 229.1 or 229.3). The best protection is afforded by the engine oils on Sheet 229.3, which fulfill more stringent specifications with regard to preventing sludge and deposits (see Sheet 221.0, page 11). These oils have a distinctly better anti-sludge characteristic than other engine oils.

- Sludging after adding a fuel or engine oil special additive.

  Do not use fuel or engine oil special additives. More information hereto is available on Sheet 219.0 of the Specifications for Service products. Reference to customer not to use special additives.

- Engine oil change not performed according to ASSYST specifications. At driven distances exceeding > approx. 3000 km, engine oil sludging may occur.

  Comply with engine oil and filter change as under ASSYST specifications. Observe remaining distance.

- Fuel grade lies outside standard (regionally contingent). If contaminated, deficient fuel is used, then engine oil sludging may occur even where approved engine oil is used.

  Operation with fuel, e.g. as under DIN EN 228. Clarify refueling behavior of customer. If engine operation regional, is temporarily possible with deficient oil only, then the startup distance has to be individually reduced, i.e. the oil change temporarily performed at an interval of, e.g. 10,000 km.

- Radiator antifreeze penetration into engine oil, e.g. through an internal engine leak (cylinder head gasket, casting porosity). The engine oil sludges within a short period. The crankcase ventilation clogs up and stops functioning. Condensation sludging clogs up the oil separator cells (engine 166).

  Rectify coolant leakage. Clean all sludged engine parts, in particular the crankcase ventilation parts. If the occurrence repeats, and casting porosity is suspected, e.g. replace crankcase.

Measures for slightly sludged engine:

ℹ Oil and filter change. Purge engine, i.e. normal engine operation in neutral, or while driving, using oil from Sheet 229.3, 228.3, or 228.5. Drain off scavenging oil after purging process (approx. 1 hour). Repeat purging process if necessary. Refill using engine oil from Sheet 229.3, or 229.1. The first oil change after clearing the sludge should be performed after approx. 10,000 km or beforehand; when doing so use engine oil from Sheet 229.3.

Measures for severely sludged engine:

ℹ Engines with severe oil sludging and caking onto engine parts and into bores have to be dismantled and mechanically cleaned. Tough sludge residue must not enter the clean side of the oil circuit, as otherwise, e.g. the piston oil spray and the hydraulic compensation elements may have their functionality impaired. Refill using engine oil from Sheet 229.3, or 229.1.

The first oil change after sludging should be performed after approx. 10,000 km; when doing so use engine oil from
Sheet 229.3.

Warranty/goodwill regulations

If in combination with engine oil sludging a warranty/goodwill claim is submitted, then a regular documentation of maintenance must be presented. The ASSYST printout is to be filed carefully for further reference.

Oil sludging in combination with an exceeded oil change interval, or because of special additives in the fuel/engine oil are costs to be borne by the customer.